

## CENTRAL INTELLIGENCE AGENCY

## INFORMATION REPORT

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Location

1. The Machine Tool and Automatic Machine Plant 1/n Gorkiy (Kiyevskiy Zavod Stankov i Avtomatov imeni Gorkogo) is located in the suburb of Svyatoshino (N 50-27, E 30-24), Oktyabrskiy Rayon, of Kiev. Svyatoshino is thirteen kilometers from Kiev station on the Kiev-Korosten line of the southwestern railroad. A branch railroad line runs from Svyatoshino station to the plant. The plant belongs to the Ministry of Machine Building, and is directly subordinate to the Chief Directorate of the Machine Tool Industry (Glavnoye Upravleniye Stankostroitelnoy Promyshlennosti: Glavstankoprom) of that ministry. This directorate is located at No. 2 Vetoshnyy Pereulok, Moscow.

History

2. The construction of the plant, which began in 1936, made slow progress until in 1937 the 18th Congress of the Communist Party decided that it should be completed as quickly as possible. Construction was completed in 1938, and the plant began to produce turning lathes, turret automatic machines, and multi-spindle automatic and semi-automatic machines of types, such as 1124 and 1136. In 1940, the 1 M 27 six-spindle semi-automatic machine of the chuck type was produced. In 1941, the plant was evacuated from Kiev. About 60 percent of the personnel and a large part of the equipment were loaded in railroad cars. The remainder of the personnel dispersed, and the rest of the equipment, mainly from the foundry and forge shops, was left at the works and captured by the Germans. The buildings were severely damaged, and only the foundations of the enormous assembly shop and of the foundry remained.
3. The evacuated personnel and equipment eventually reached Kizel (N 59-03, E 57-38) in Molotov Oblast. Kizel is 119 kilometers from Solikamsk on the Chusovskaya-Solikamsk line of the Molotov railroad. The works was accommodated in the unfinished building of the Kizel coal concentrating plant. After three weeks of continuous work, the plant began preparing for the production of munitions

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and shells of various calibers and also assembled machine tools and automatic machines from the parts which had been brought there. About the middle of 1942, when the equipment of the plant had been completed by the arrival of new machines, orders were received for the production of complex tank parts for tank works. The plant was designated No. 185 i/n Gorkiy and remained under the control of the People's Commissariat for Machine Tool Industry. At that time, the director of the works was Boris Lvovich Bershadskiy. In 1943, the plant was awarded the Order of the Labor Red Banner for the execution of orders for the tank industry. In addition to munitions and tank parts, the factory designed and built special new machine tools for the aviation, tank, and munitions industries. Production included eight-spindle semi-automatic machines for machining ammunition, semi-automatic thread cutting machines, and turret lathes. The plant also produced single-spindle automatic machines, designed by A. Ya. Lopata, A. Tereshchenko, and others, under the direction of Chief Designer Gluvchinskiy (fnu).

4. After the liberation of Kiev at the end of 1943, reconstruction of the plant at Svyatoshino began. G. F. Kostenko, former director of the Gidroprirod Works of the Machine Tool Industry at Kharkov, was appointed director of the Machine Tool and Automatic Machine Works i/n Gorkiy at Kiev. By April 1944, the foundry shop had already been rebuilt, and several of the less damaged buildings had been repaired. Then, the assembly shop was built and the heat treatment shop restored and expanded, and, in 1945, the small series assembly shop was restored and expanded. By 1946, the factory had been almost entirely restored, and Soviet and foreign equipment had been installed. Foreign equipment included some from German works, which arrived via Ventspils, Latvian SSR.

#### Description of Machine Tools and Automatic Machines Produced

5. Postwar production includes the following:

- a. Single-spindle automatic turret lathes of types 1136, 1124, 4-1136, 5-1124, 1136-U, 1136-M, and 1124-M; production in medium series.

- 1) The 1136 automatic turret lathe is based on the foreign Index type and is intended for machining articles made out of bars of circular, hexahedral, or square cross-sections. As it is possible to use a number of supplementary devices, articles of very complex shape can be machined on this lathe.

Maximum diameter of rod: 36 mm.  
 Maximum feed of rod: 90 mm.  
 Diameter of turret head: 140 mm.  
 Maximum travel of turret head: 80 mm.  
 Number of openings in turret head: 6.  
 Diameter of openings in turret head: 24.5 mm.  
 Number of stages of speed of spindle: 16.  
 Range of spindle speed for turning: 120-1,500 rpm; for thread cutting, 60-750 rpm.  
 Power of electric motor: 3.7 kw.  
 Length of lathe: 1,800 mm; width, 925 mm; height, 1,460 mm.  
 Weight of lathe: 1,800 kg.

Normally, the lathe works with two lateral supports placed horizontally, front and rear. When complex parts are being machined, a third support is employed, mainly for cutting off work. For lubrication, there is a pump on the lathe, which feeds oil to the spindle bearings and the gear-box. For cooling, there is a geared pump which supplies a cooling liquid.

- 2) The 1124 automatic turret lathe has been completely standardized with the 1136, from which it differs only in the smaller dimensions of the rods to be machined and in the higher spindle rpm. The weight of the 1124 is 1,785 kilograms. The maximum diameter of the rods is 24 mm, and the spindle speed range for turning is 190-2,400 rpm, and for thread cutting is 95-1,200 rpm.

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- 3) The 5-1124 and 4-1136 automatic turret lathes are modifications of the 1124 and 1136. The design of the majority of the assemblies has remained unchanged. Improvements have been introduced in the design of the spindle supports, gear-box, and reduction gear.
- 4) The 1124-U and 1136-U are further improvements of these turret lathes. They differ in the design of the main drive, gear box, and reduction gear. They have only two spindle speeds, which are automatically changed over during work.

b. Turret lathes of 1336, 1336-M, and 1 A 336 types; production in large series

- 1) The 1336-M is intended for machining parts in a number of consecutive operations; i.e., turning, drilling, and reaming.

Height of center: 185 mm.

Minimum and maximum distance from the spindle flange to the turret head: 60 and 660 mm.

Diameter of spindle openings: 39 mm.

Maximum dimension of bar to be machined: circular - 36 mm.

diameter; square - 27 mm side; hexahedral - 32 mm between sides.

The capstan has 16 tool holes and 8 supports.

Number of speeds of spindle: 12.

Range of spindle speed: 48 to 1,160 rpm.

Number of longitudinal feeds of turret heads: 6.

Range of feeds of turret head per revolution of spindle: longitudinal-

0.60-0.56 mm, lateral-0.04-0.39 mm.

Three-phase electric motor.

Power of main electric motor, type A D 34/2: 3 kw; number of rpm: 1,500.

Power of electric motor for cooling-liquid pump: 0.125 kw, with 3,000 rpm.

Length of lathe: 2,280 mm; width, 1,000 mm; height, 1,280 mm.

Weight of lathe: about 1,600 kilograms.

- 2) The 1 A 336 turret lathe is a high-speed version of the 1336 M. Produced in 1949, it insures high rates of machining and enables high-speed turning with a maximum cutting speed of more than 700 mpm for chuck work and 225 mpm for rod work. The main differences from the 1336 M are the increase of the power of the electric motor to 4.3 kw and a higher range of spindle speed.

c. Automatic and semi-automatic machines of types 1261, 1261 M, 1261 P, 1262, 1262 M, and 1262 P. All these machines are standardized. Production is in medium and small series.

- 1) The 1261 is a six-spindle automatic lathe and is intended for the production of articles made from calibrated steel, brass, and aluminum rods of circular, square, and hexahedral cross-sections.

Maximum diameter of circular rod to be machined: 58 mm.

Maximum side of square rod: 40 mm.

Maximum diameter of inscribed circle of hexahedral rod: 48 mm.

Maximum length of rod to be machined: 4 m. There is a special stand for the support of rods projecting from the spindle.

Maximum length of feed of rod: 160 mm.

Power of electric motor of main drive: 15.2 kw.

Length of lathe: 5.72 m; width, 1.2 m; height, 1.7 m.

Weight: about 6,500 kilograms.

Special devices can be fitted to the machine for thread cutting, high speed drilling, and reaming. It has a mechanical clamp, and a mechanical device for automatic switching off of feed when the rod has been used up. There are two electric motors, one for main drive and the other for the pump with the cooling liquid, Sulfofrezol.

Lubricating system: centralized lubrication of the principal mechanical devices of the machine and independent lubricators.

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- 2) The 1261 M six-spindle automatic lathe is intended for serial and mass production of articles made out of calibrated rods of various cross-sections and material, and requiring a series of operations, i.e., turning, drilling, reaming, thread-cutting, trimming, and cutting.

Maximum diameter of bar to be machined: 50 mm.  
 Maximum length of bar: 3600 mm.  
 Minimum remainder of bar: 80 mm.  
 Maximum feed of bar: 160 mm.  
 Diameter of spindle opening: 76 mm.  
 Minimum and maximum diameters of threads to be cut: 4 mm and 40 mm.  
 Range of spindle speed: 88-1,015 rpm; for high-speed work: 140-1,620 rpm.  
 Number of supports: 4.  
 Number of speeds of working spindles: 66.  
 Power of electric motor for main drive: 14 kw; number of rpm: 975.  
 Power of electric motor for cooling pump: 0.65 kw; rpm: 2,800.  
 Length of machine: 5.7 m; width, 1.2 m; height, 1.8 m.  
 Weight of machine: about 7,000 kilograms.

- 3) The 1261 P six-spindle semi-automatic machine is intended for machining articles in a number of consecutive operations for mass or serial production.

Maximum diameter of workpiece: 130 mm.  
 Maximum diameter of article clamped in the chuck: 100 mm.  
 Maximum length of workpiece: 120 mm.  
 Number of longitudinal supports: 1; of lateral supports: 4.  
 Number of speeds of working spindles: 38.  
 Range of spindle speed: 58-980 rpm.  
 Three-phase electric motor.  
 Power of motor for main drive: 14 kw; 750 rpm.  
 Power of electric motor for cooling pump: 0.65 kw; 2,800 rpm.  
 Length of machine: 3,180 mm; width, 1,440 mm; height, 1,755 mm.  
 Weight of lathe: about 7,200 kilograms.  
 Hydraulic grip with a wide range of adjustment of its force.<sup>2</sup>

- 4) 1262 M four-spindle automatic machine

Maximum section of rod to be machined: round - 50 mm; square - 35 mm; hexahedral - 43 mm.  
 Maximum length of feed of rod: 160 mm.  
 Maximum length of turning: 145 mm.  
 Range of spindle speed: 88-1,015 rpm (high-speed work: 140-1,620 rpm).  
 Power of main electric motor: 14 kw.  
 Length of machine: 5,665 mm; width, 1,200 mm; height, 1,855 mm.  
 Weight: 6,800 kilograms.

- 5) 1262 P four-spindle semi-automatic lathe

Maximum diameter of work piece: 130 mm.  
 Range of spindle speed: 56-980 rpm.  
 A hydraulic system adjusts the gripping and release of parts in the chucks and also the stopping and starting of the spindle in the loaded position.

- d. Six-spindle semi-automatic machines of types 127, 127 A, and 1-127 A, medium serial production. These six-spindle semi-automatic horizontal machines are for machining parts made of light alloys or cast iron in a chuck or other device. The machine has a mechanical grip with a coil spring which is insufficiently strong for heavy work, such as machining steel parts.

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- e. Multi-spindle semi-automatic machines of types 129, 129 A, 129 M, and 4a 129 A; produced in medium series. These four- and five-spindle machines are for machining parts of complex profile which is awkward for turning. The workpiece is gripped in devices and during machining travels without rotating. These machines are based on the foreign Gos-De-Lieu semi-automatic machine.
- f. 1265 horizontal six-spindle automatic machine for machining rods or tubes with maximum diameter of 65 mm; small serial production since 1953.

Maximum length of workpiece: 175 mm.  
 Range of spindle speed: 60-1,000 rpm.  
 Power of main electric motor: 28 kw.  
 Weight of machine: 13,000 kilograms.

- g. 1290 heavy four-spindle automatic machine for high-speed machining of rods and tubes with diameter of 70 to 100 mm. Weight of machine: 24,500 kilograms; small serial production since 1952.

- h. Drilling and turning lathe; medium serial production since 1951;

Maximum diameter of workpiece: 1,250 mm.  
 Diameter of face plate: 1,030 mm.  
 Maximum height of workpiece: 970 mm.  
 Maximum weight of workpiece: 2 tons.  
 Range of face plate speed: 19.5-500 rpm.  
 Power of main electric motor: 24 kw.  
 Weight of machine: 13 tons.  
 Work with hard alloy tools is possible.

- i. Universal screw-cutting lathes for machine and tractor stations have been produced in medium series since 1953.
- j. Special machine tools for agricultural machinery are produced against individual orders and in small series. An automatic line for the production of chisel-shaped P-702 ploughshares from 149 D rolled steel for tractor ploughs was completed and tested in January 1954, and consists of four sections which carry out different processes. In the first section, a strip is cut into blanks by a press. The blanks then pass to another press in which they are bevelled and pierced with holes. They then go to a storage place where a workman places them on the conveyors of the second section. They go on to a turntable with six positions, where the holes are counter-sunk and the bevels are polished. From here they move to a grinding assembly with seven grinding heads which grind the blades and polish the surfaces. Then the blanks are passed mechanically to the bending and heat treatment section, where they are heated by high-frequency currents and bent on a hydraulic press. The blades are then heated, dropped into a quenching bath, and heated by high-frequency currents, after which they go into a cooling place. In the third section, the scale on the surface is cleaned off by spraying with an abrasive liquid. In the fourth section, the blanks are automatically stacked in fives, tied up, moved by conveyor to an appliance for anti-corrosive treatment, and dispatched to the finished products store. Inspection of the machining of ploughshares is carried out by three checkers by means of high-speed devices, which check the profile of the ploughshare and its toughness, and make an external examination. The line is served by three operators, five adjusters, and three checkers. The output of the line when tested was about 1,900 ploughshares in an eight-hour shift. This automatic line will be sent to an agricultural machinery works in Kalinin at Rubtsovsk, Altay Kray. It is proposed to build a second line for the Works in October Revolution in Odessa.

#### Actual Output

- 6. In 1953, the plant produced about 1,900 automatic and semi-automatic machines and machine tools, including about 200 simple screw-cutting lathes for machine and tractor stations. The foundry has large losses from rejected material. In 1953, rejects were valued at one million rubles.

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Personnel

7. There are 3,100 to 3,200 employees working in three shifts at the plant. Following is a list of leading personnel:

Director: G.F. Kostenko.  
 Acting Chief Engineer: Shcherbakov (fnu).  
 Chief Designer: Geyets (fnu).  
 Chief Power Engineer: Kolyadko (fnu).  
 Chief Technologist: Porton (fnu).

8. The design bureau of the plant is an important organization with a large number of experienced designers. Its head is Geyets, and its personnel include the following designers: A.Ya. Lopata, P.G. Tryasunov, A. I. Tereshchenko, M.L. Orlikov, I.G. Dondik, N.D. Reznik, S.M. Zamanskiy, L.M. Dubinskiy, M.P. Bondar, V.M. Kanevtsev, N.S. Manko, D.A. Draiger, V.A. Shevchuk, G.Yu. Burliy, G.O. Stelmakh, V.N. Grechusnikov, Ryzhov (fnu), and Kobus (fnu). The design bureau works in close touch with the Chair and Laboratory of Machine Tool Construction of the Kiev Polytechnic Institute under A.N. Rabinovich, Dr. Tech. Sc. The general trend of the plant's designers in designing machine tools and automatic machines and in modernizing them is to increase the reliability of performance; to reduce the time required for adjustment and for auxiliary operations, the weight of machines, and the manpower required for production; and to increase the toughness of the construction.

Shops

9. Following is a list of plant shops:

First, Second, and Third Machine Shops.  
 Assembly Shop.  
 Assembly Shop for small series.  
 Forge Shop.  
 Foundry Shop.  
 Heat-treatment Shop.  
 Tool Shop.  
 Mechanical Repair Shop.  
 Experimental Shop.  
 Electrical Shop.  
 Standards Department.  
 Steam Power Department.  
 Consumer Goods Department.  
 Central Laboratory.  
 Transport Department.

Comments

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1. According to a Soviet machine tool catalogue, the power of the main motor of the 1261 M is 15.2 kw with 1,000 rpm. The power of the cooling motor is 25 kw with 1,500 rpm.
2. A Soviet machine tool catalogue gives the power of the cooling motor of the 1261 P as 25 kw with 1,500 rpm. The weight of the lathe is given as 6,500 kilograms.

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